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A HISTORY OF COTTON BREEDING IN ZAMBIA

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Before the dissolution of the Federation in 1964, cotton in Zambia was not an important crop and, therefore, cotton experimentation, especially breeding, was not developed. In the period between 1964 and 1966, with the expansion of the crop, the need for a variety adapted to local conditions was realised. Breeding work consisted wholly of variety trials conducted for the Gatooma Research Station in Rhodesia. Mount Makulu, Magoye and Msekera Research Stations were involved as locations. Very closely related lines derived from Albar (1) 627 and Albar 637 were tested together with American varieties (Deltapine 45, Deltaphine Smooth Leaf, Acala). The Zambian Cotton Research Section was created in September 1966, with the appointment of a Cotton breeder from the C.R.C. (2). The basic breeding work was done at Mount Makulu while the advanced selected lines were tested at Magoye and Msekera Research Stations.

The priority at this stage was to organise a cotton multiplication scheme for the Rhodesian Albar 65F. Selections of A65F, and crosses with 4 introduced varieties were made in 1966/67. These came from the USA and a French research insitute, IRCT (3).

In 1968, the objectives of the breeding work changed as a result of important developments in the country. Following the opening of textile mill at Kafue it was found that the current commercial Albar variety was of too high a quality for the main type of material to be produced in the first period. It was also considered that small scale farmers needed varieties with big bolls for handpicking and plants that were not too tall for essier knapsack spraying. In addition, for the increasing number of large scale growers delinted seeds for mechanical sowing were needed. Short determinate varieties stormproof bolls for machine picking were also needed. A medium term programme started on these lines and lasted until 1974. In addition Albar maintenance, multiplication and improvement (gin percentage and reduction of the amount of fuzz) continued. A study of the generations following the crosses in 1967 was also undertaken.

(1) Allen Bacterial Blight Resistant

(2) Cotton Research Corporation (England)

(3) Cotton and Exotic Textiles Research Institute (France)

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In 1969, a recapitulatory study indicated that Albar 65F (A637 stock) was inferior to the current representatives of the Albar 627 stock and its multiplication was therefore stopped. On the other hand, the Albar lines showed little variability, indicating there was little scope for further development. As a consequence, the priority was given to the Albar hybrids made in 1966/67, and the programme of breeding within the Albar stock itself was concluded by the constitution of the multiline Improved Albar aA (=Impala) and its release in 1973. The decline of large scale fully mechanised cotton.

production and the efficiency of the delinting machines installed at Lusaka ginnery rendered obsolete the efforts to develop a variety for mechanical harvesting and with naked seeds. The American variety Deltapine SL extensively tested from 1964 to 1970 was rejected in 1971.

According to the 1972 trials, the most promising progeny in the Albar hybrids was derived from the cross A637 x HG9 (Tchad) called EZA, with high jassid resistance, ginning percentage and yield. Another cross, A637 x Acala 4-42, called ALA, had the best fibre quality. The textile industry by then had a demand for higher quality cotton than what was grown in the early seventies Since Eastern Province was considered to be an area favourable to the production of high quality cotton, ALA was expected to meet this need in that province. EZA was essentially suited better to the Central and Southern Provinces. In 1973, 29 newly introduced varieties (from Nicaragua, USA, Tanzania, Uganda, Malawi and Central African Republic) were compared with Impala. All showed incomplete characteristics. The African varieties were hairy, jassid resistant, with a medium to high ginning percentage, but had insufficient productivity. The American varieties were highly susceptible to jassids although they gave higher ginning perentages than Impala. From this programme, 4 Nicaraguan and 2 American varieties were crossed to Impala in 1974.

In 1975, the cotton section was closed due to the de- parture of Mr. Church ~~staff~~ following the dissolution of the cotton Research Corporation (2)

Three varieties, namely EZABEL (EZA (71)-{M), CHUREZA (CHURCH-EZA (73)-{M) and CHILALA (CHILANGA-ALA (73)-M) were released during the same period after increasing from Church's pure seeds. As no breeder's seed was provided by the cotton section until 1979, the seed services recirculated the certified seeds of each current commercial variety in order to support the seed multiplication scheme and to supply commercial seeds to the growers. This resulted in a mixture of the current commercial varieties.

The cotton breeding work started again in 1978, following the appointment of Dr. Chami on FAO. assignment with the duty of "undertaking a selection programme with the existing population and introducing exotic hirsutum varieties to test their performance." Dr. Chami noted very soon that the degree of purity within both commercial varieties (CHILALA and CHUREZA) was low (50 to 60% and 30% of off types respectively). Therefore he put the stress on CHILALA and CHUREZA reselection, according to the standards described by CHURCH in 1974. He also started a programme of crosses between the local and some exotic varieties originated from West Africa, USSR, Sudan, USA and Syria. In 1979/80 and 1980/81 the cotton breeding programme was also carried out by I.R.C.T. consultants, who took over when the FAO expart left. This work involved the continuation of the programme defined by Dr. Chami. However, in the absence of staff continuity no conclusive results were obtained.

The present programme involves short, medium and long-term approaches. In the short term improved Chilala and Chureza varieties should become commercially available in 1986/87.

Some promising introduced varieties are currently being tested under a wide range on conditions. Depending on the results of these trials it is hoped to put two varieties before the variety release committee during 1984. Finally crosses between local and exotic varieties are being made which could lead to the development of new varieties for the 1990's.

TABLE 12b (Contd)

GERMPLASM COLLECTION (II)

VARIETY	Earl (%)	Ha (cm)	HFFB (cm)	NVB	RVB (%)
CHUREZA	39	88.1	15.9	1.9	10.6
BI 1068	22	64.0	14.2	0.6	12.9
B 163	30	84.6	13.6	2.0	22.9
BC bulk 4750	39	94.2	10.9	3.3	10.8
802	40	89.2	11.9	1.8	11.6
BP 52	37	93.8	17.5	2.6	16.8
CHUREZA	38	86.6	12.9	1.4	20.1
Almac 69/11	24	56.8	12.3	2.3	12.2
Barak 71/6	34	75.0	13.2	2.4	14.8
Tashkent 1	51	82.1	11.5	1.5	10.4
Tashkent 3	49	81.5	14.7	1.7	14.4
175-F	26	70.9	11.0	1.3	10.0
CHUREZA	32	78.9	13.7	1.7	18.3
Albar B.S.	15	90.0	14.8	2.5	12.7
ALA 54	23	75.3	14.3	2.0	21.3
ALA 72(10)	22	73.3	13.0	2.3	17.1
ALA (73) 2M	25	85.3	13.7	2.3	10.8
DZA (73) M	43	68.6	8.7	0.9	7.5
CHUREZA	28	82.2	12.0	2.1	16.6
DZA (73) 2M	15	74.5	9.8	1.1	13.7
78 CR36	23	73.3	9.7	1.7	19.3
78 CT3 18	35	74.7	9.7	1.8	19.9
78 $CA_3$24	33	61.2	10.6	1.6	14.4
CHUREZA	38	83.0	16.1	2.8	16.6
78 $CR_3$36	40	68.8	10.2	2.4	18.7
78 $CM_3$48	48	67.1	13.4	1.4	15.3
78 $CB_3$54	49	58.1	14.4	2.7	21.8
78$CA_3$72	44	63.7	11.2	1.9	10.4
78 $AR_3$78	34	63.3	11.8	1.6	23.3
CHUREZA	45	82.7	12.9	2.4	12.1